

**NEPIONEMA, A NEMATINE SAWFLY GENUS NEW TO NORTH AMERICA,
AND AN UNUSUAL NEW SPECIES OF NEMATUS
(HYMENOPTERA: TENTHREDINIDAE)**

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Abstract.—*Nepionema* is reported in North America for the first time, and the second species in the genus, *N. appalachiana*, n. sp., is described from specimens discovered in West Virginia. The genus was previously known by only a single species from the European Alps. *Nematus radialis*, n. sp., is described from Virginia and West Virginia. It represents the first species of *Nematus* to possess a radial crossvein in the forewing. This crossvein is present in the female but absent in the male.

Key Words: *Nematus*, *Nepionema*, sawflies, Symphyta

Unexpected specimens of the genus *Nepionema* appeared in collections from the Appalachian Mountains of West Virginia. *Nepionema* was previously known from a single species, *N. helvetica* Benson, from elevations of 6000 to 8500 feet in the Swiss Alps and later recorded from Italy (Pesarini and Pesarini 1988). Since the sawfly fauna of eastern North America has much more in common with the fauna of eastern Asia, I did not expect to find representatives of a genus from the high European Alps at this locality. Explanations may eventually be found, but currently I would have to attribute this occurrence to a lack of collecting. This genus may be more widely distributed throughout the Palearctic and Nearctic regions than expected. The unusual European species of *Nepionema* is not common—not even discovered until 1960—and its unknown, apparently obscure, habits may preclude collections even by ardent collectors. The species from West Virginia was taken from within a dense deciduous forest early in the season, a place and time usually avoided by collectors because of lack of pro-

ductivity. Relatively few insects are seen flying at that time of year in that habitat!

A species of *Nematus* which has a radial crossvein in the forewing only in the female was found at study sites in Virginia and West Virginia. This difference between sexes has not been reported in sawflies, and this species is also described below.

Nepionema Benson

Nepionema Benson 1960: 173. Type species: *Nepionema helvetica* Benson. Original designation.

Antenna more than $2 \times$ head width. Eyes subparallel, lower interocular distance $1.5 \times$ eye length; malar space shorter than breadth of 2nd antennal segment; clypeus truncate to slightly emarginate; outer surface of mandibles dissimilar, left mandible markedly constricted near middle, right mandible more regularly tapering to apex; interantennal area strongly produced; antennal hollows (between antennal sockets and inner orbits) deep. Thorax with suture dividing mesoprescutum medially, suture separating

posttergite of mesoscutellum, and suture separating epicnemium from mesepisternum faint to obsolete. Forewing (Fig. 1) with vein 2r-m absent; 2r present; Sc almost interstitial with origin of M from Sc+R, costa strongly swollen apically; basal stub of vein 2A+3A straight. Hindtarsus almost as long as hindtibia; tibial spurs little longer than apical width of tibia; tarsal claws simple. Female with strong, well sclerotized ovipositor, slightly shorter or longer than hindtibia; cerci equal to or more than half or more length of sheath.

The West Virginia specimens share all characteristics of *Nepionema*, a genus which is close to the North American *Neopareophora* and keys to that genus in Ross 1937 and Goulet 1992. The absence of vein 2r-m in the forewing; obsolescent sutures dividing the mesoprescutum medially, separating the posttergite of the mesoscutellum, and separating the epicnemium from the mesepisternum; and the long, well sclerotized female ovipositor separate *Nepionema* from *Neopareophora* and place these specimens with the European *Nepionema*.

Nepionema appalachiana Smith,

NEW SPECIES

(Figs. 1–3)

Female.—Length, 5.0–6.0 mm. Black; mandible reddish brown; tegula whitish; apical tergum, cercus except for blackish apex, and base of sawsheath whitish; legs with basal $\frac{1}{4}$ to $\frac{1}{3}$ of coxae blackish, apically yellow orange, trochanters and femora yellow orange, tibiae yellowish to white (whiter than femora), extreme apex of hindtibia and all tarsi black. Texture shining and impunctate except for hind orbits and pronotum which are somewhat more rugose than rest of head and body; pubescence on head and thorax about as long as diameter of an ocellus. Wings hyaline; veins black with costa and stigma brownish. Antennal length $2.25 \times$ head width, subequal in length to costa of forewing to stigma; 3rd segment subequal in length to 4th segment. Malar

space $1.5\text{--}2 \times$ diameter of front ocellus; interantennal arca strongly produced; inner margins of eyes subparallel, lower interocular distance $1.4 \times$ eye length; postocellar area $4 \times$ broader than long. Suture separating epicnemium from mesepisternum faint, but epicnemial area shining and lacking hairs present on mesepisternum. Hindtibia $1.25 \times$ length of hindtarsus. Cercus tapering to apex, as long as sheath. Hindwing with length of petiole of anal cell $3 \times$ greatest width of cell. Sheath as in Fig. 2; in dorsal view broad but tapering to slender apex. Lancet strongly sclerotized, with annular armature on dorsal portions of annuli 4–12; length $0.8 \times$ length of hindtibia (Fig. 3).

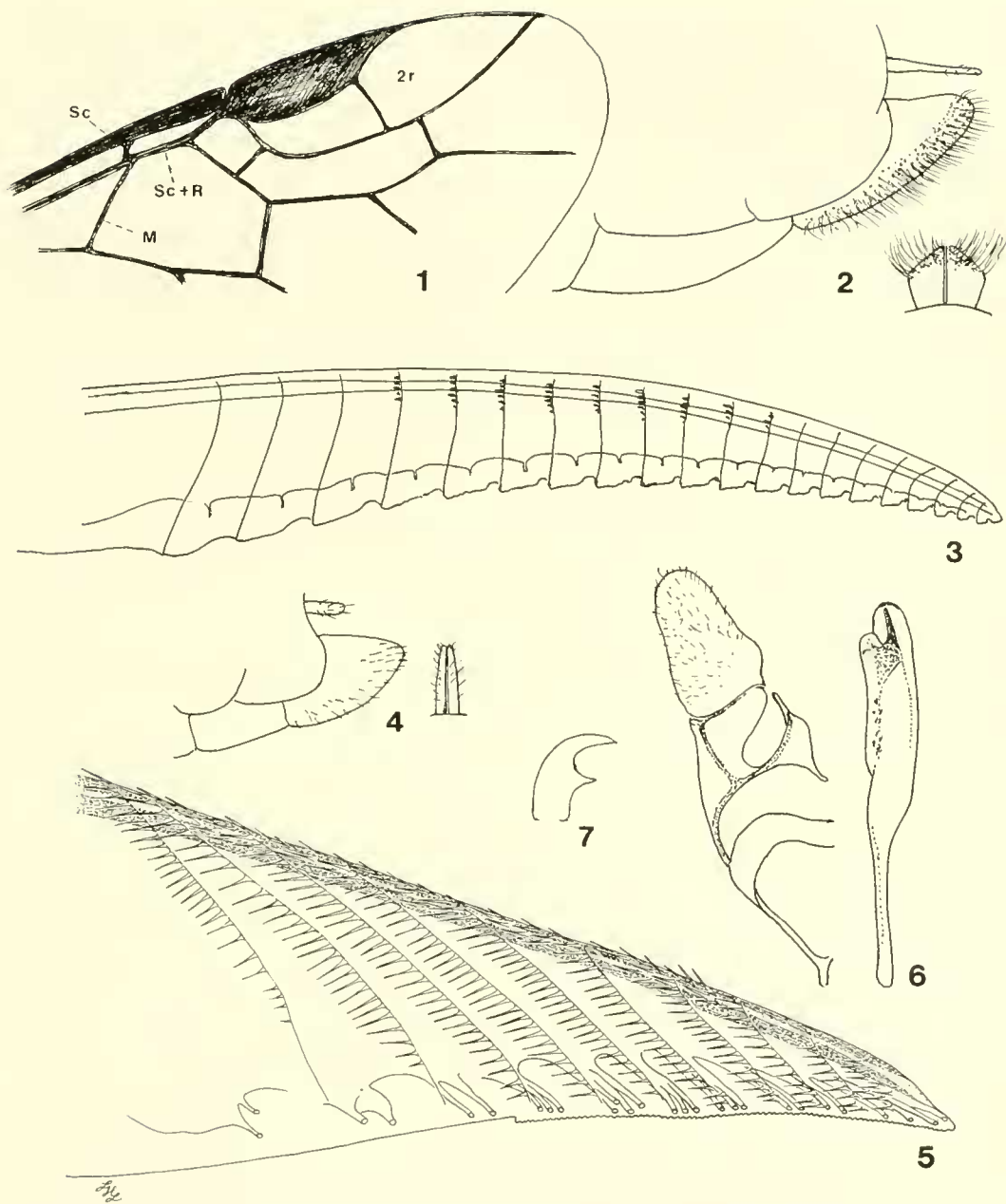
Male.—Unknown.

Holotype.—Female, labeled “West Virginia: Tucker Co., Fernow Exp. Forest, 39°03'N, 79°40'W, 8-19-IV-92, E. M. Barrows,” “Malaise trap #4-4.” The elevation of this site is about 2300–2500'. In the National Museum of Natural History, Washington, D.C.

Paratype.—Same data as holotype except from Malaise trap #7-1 (1 female). Deposited with the holotype.

Discussion.—Specimens were collected from traps in two watersheds (4 and 7) in the Fernow Experimental Forest in the Monongahela National Forest, about three miles south of Parsons, West Virginia. The traps were placed within a forest dominated by oaks and intermixed primarily with beech, sweet birch, maple, yellow poplar, black cherry, pin cherry, white ash, basswood, rhododendron, and black locust (Anonymous 1987). Trap 4-4 was located 20 m up the north slope from the creek bottom of watershed 4, and trap 7-1 was located approximately 40 m up the south slope from the creek bottom of watershed 7. The slopes are approximately 20 to 30°.

April 8–19 is the earliest collection period at this site. Trees and shrubs leaf out later in the spring, and the area is essentially barren except for some spring ephemerals such as early violets and trilliums. The strong



Figs. 1-7. 1-3, *Nepionema appalachiana*. 1, Forewing, apical section, 2, Female sheath, lateral and dorsal views. 3, Female lancet. 4-6, *Nematus radialis*. 4, Female sheath, lateral and dorsal views. 5, Female lancet. 6, Male genitalia, ventral view of genital capsule on left, lateral view of penis valve on right. 7, Tarsal claw.

ovipositor indicates that this species probably oviposits into twigs or developing buds of its host, at least some plant tissue that is much tougher than succulent leaves which

are probably not available at that time of year.

The female ovipositor is remarkably similar to *N. helvetica* but has fewer annular

spines. *Nepionema helvetica* has short annular spines on the full lengths of annuli 4–16. The general shape and direction of the annuli are also different (compare Fig. 3 with Fig. 3 of Benson 1960). In coloration, *N. helvetica* has the femora black with only apices brownish yellow and some white on the tarsi.

Nematus radialis Smith, NEW SPECIES
(Figs. 4–7)

Female.—Length, 6.0–7.0 mm. Antenna and head black with clypeus, labrum and mouthparts white and apex of mandible reddish; thorax with cervical sclerites, anterior margin of pronotum, mesonotum except for small reddish spot on posterior portion of lateral lobes, metanotum, mesepimeron, and metepimeron black, most of pronotum, perapteron, and tegula white, mesepisternum, epicnemium, and mesosternum orange; abdomen black above except for white apical tergum, white laterally and below, sheath brownish; legs mostly whitish to pale orange with apex and apical $\frac{1}{3}$ to $\frac{1}{2}$ of inner surface of hindtibia and hindtarsus black, femur and base of hindcoxa more pale orange than whitish, fore- and midcoxae, apex of hindcoxa and tibiae, fore- and midtarsi blackish. Wings hyaline; veins black with costa, subcosta, and dorsal half of stigma brownish. Texture shining, with slightly more roughened areas on outer orbits, interantennal area, supraclypeal area, and inner orbits; abdomen with fine transverse microsculpture. Antenna with 1st segment about as long as broad, 2nd segment broader than long; 3rd segment shorter than $(0.7 \times)$ 4th segment; antennal length $3 \times$ head width. Clypeus shallowly, circularly emarginated; malar space a little broader than diameter of front ocellus; outer surface of each mandible, viewed from the side, markedly constricted near middle; postocellar area $3 \times$ broader than long; inner margins of eyes parallel, not converging below, lower interocular distance $1.2 \times$ eye length; interantennal area protuberant. Tarsal claw with

short inner tooth, about half length of outer tooth and situated near center of claw (Fig. 7); length of hindbasitarsus subequal to length of 3 following tarsal segments combined. Forewing with vein 2r present (as in Fig. 1); costa not swollen apically. Sheath rounded in lateral view; slender in dorsal view (Fig. 4); cerci about half length of sheath. Lancet short, triangular, ventral margin with fine serrations, without distinct serrulae (Fig. 5).

Male.—Length, 5.5 mm. Color similar to female except margins of mesepisternum and mesosternum black, hindtibia entirely pale orange, and abdomen black laterally as well as dorsally with sterna white. Structural features as for female, except forewing lacking crossvein 2r. Eighth tergite without prominent procidentia. Genitalia as in Fig. 6; penis valve with spine of lateral flap dorsal.

Holotype.—Female, labeled “West Virginia: Tucker Co., Fernow Exp. Forest, 39°03'N, 79°40'W, 10-19-V-1992, E. M. Barrows,” “Malaise trap #4-4.” In the National Museum of Natural History, Washington, D.C.

Paratypes.—VIRGINIA: Clarke Co., University of Virginia Blandy Experimental Farm, 2 mi. S. Boyce, 10-21-V-1991, Malaise trap #3, D. R. Smith (1 female, 1 male); same data except 14-24-V-1990, trap #9 (1 male). WEST VIRGINIA: Same data as holotype (1 female); same data as holotype except trap #4-5 (1 female); 20-29-V-1992, trap #4-5 (1 female), trap #1-1 (1 female); 30-IV-9-V-1992, trap #4-1 (1 female); 11-20-V-1991, trap #13-1 (1 female), trap #4-4 (1 female), trap #4-5 (2 females), trap #4-7 (1 female), trap #4-6 (1 male). Deposited with the holotype.

Discussion.—The radial crossvein is present in the female but not in the male. It is not too unusual to find differences in wing venation between sexes, as it is especially common in some genera that males have a peripheral vein in the hindwing and females do not. The presence or absence of

the radial crossvein of the forewing between sexes, however, is the first instance known to me in sawflies. Because of the presence of the radial crossvein and an inner tooth on the tarsal claws, females would key to *Adelomos* in couplet 11 of Ross' 1937 key and in couplet 22 of Goulet's 1992 key. The males, however, because of the relatively short inner tooth of the tarsal claw, would most likely key to *Pachynematus* in couplet 32 of Ross' key and couplet 31 of Goulet's key. In Benson's (1958) key to British species, the female would key to *Dineura*, and the male to *Pachynematus*. If the tarsal claws were considered to have a longer inner tooth, the males would key to *Nematus* in all keys. Except for the crossvein and relatively short inner tooth of the tarsal claw, both sexes share all other characters with species of the *Nematus ribesii* group, which I separated in the 1979 Hymenoptera Catalog, mostly characterized by the short sheath and very short, triangular ovipositor. The male genitalia are also similar to those of the *ribesii* group. I believe this species is best placed in *Nematus*, and the genus will have to be redefined by having one or more species with a radial crossvein in the forewing of the female, and a shorter inner tooth on the tarsal claw than most species.

Differences of this species from the following genera preclude its placement in them. *Dineura* has a long inner tooth on the tarsal claw; cerci longer than the sheath; a strongly sclerotized, long ovipositor; costa of forewing dilated; and mandibles evenly tapering in lateral view. *Adelomos* has, though apparently variable, a radial crossvein in the hindwing; a short ovipositor; and a long inner tooth on the tarsal claw. *Pachynematus* has the clypeus more shallowly emarginated; most species have a long, well sclerotized ovipositor (except a few associated with conifers in the Palearctic Region); the male penis valve of most species has a long tooth which is ventral to the lateral flap; the eighth tergite of the male usually has a carina-like procidentia or a long

produced one; the tarsal claws have a very short inner tooth, much shorter than *N. radialis*; and the seta-bearing pits of the head are usually raised above the surface.

The short lancet with the absence of distinct serrulae differentiate *N. radialis* from all other species of the *ribesii* group.

For description of the habitat, see discussion of *Nepionema appalachiana*. The specimens from Virginia were collected from traps set within an 85-year-old forest composed primarily of oak, hickory, and elm. Thus, collections from both sites were from within forests.

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